# Proportional Representation

BY

## THE SINGLE TRANSFERABLE VOTE

THE SYSTEM AND ITS METHOD


BY

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## *PREFACE TO THE SECOND EDITION*

I have endeavoured to make my meaning more clear by alterations and additions in places.

A reference to the reports of the Proportional Representation Society in England will show the efficiency of the single transferable vote and the increasing popularity of this method of election.

*Mylapore,*
*Dec.*, 1929.

K. V. KRISHNASWAMI AIYAR

## *PREFACE TO THE FIRST EDITION*

The system of proportional representation is so little known that there is a great deal of misunderstanding about it. An attempt has been made in the following paper to explain what it is and the method of its working. There is an idea prevalent amongst many that the system itself is irrational and that the rules framed for calculating and arriving at the results of an election under this system, are arbitrary. This is a fundamental error due to imperfect appreciation of the subject. In this pamphlet, therefore, some endeavour has been made to explain the *rationale* of the system and of the rules, as far as possible, and to show how the latter are the logical outcome of the principles sought to be worked out and cannot be different consistently with the basic principles of the former.

The aim and purpose of proportional representation is, that in a representative body every component shade of opinion of the electorate, of any respectable strength or proportion, ought to be represented. In other words, the representative body ought to be the electorate

itself, in miniature. There may be a question whether this is the sounder view and whether it is consistent with, or at any rate, fosters, the growth of the true ideals of democracy. But once the view is accepted as sound, the method of the single transferable vote is best calculated to obtain the end sought to be secured, and is not, by any means, open to question or criticism. That is but the achievement purely of a correct mathematical imagination applied to the solution of a political question and the rules are carefully designed to interpret the system accurately and work it smoothly and without clog. It may be added that a study of the results of elections conducted on this system discloses that candidates have been returned uniformly in the proportion in which the electorate is divided in opinion.

An appendix has been added, explaining the computation in a practical instance of an election and showing the application of many of the important principles of this scheme.

*Mylapore,*
*18th Sept.*, 1923. } K. V. KRISHNASWAMI AIYAR

# Proportional Representation

BY

## THE SINGLE TRANSFERABLE VOTE

### THE SYSTEM AND ITS METHOD

## I. GENERAL PRINCIPLES

### THE SYSTEM

Proportional representation by the single transferable vote is a mode of election by which the due representation of interests in minority is safeguarded. In the ordinary ballot, the interests in majority alone return candidates as they overpower the minorities by their number. The object of this system is to avoid that result. Under this system a minority interest can return candidates of its own in proportion to its strength at the poll as compared with the other interests. Success at the election does not depend upon the question whether one candidate polls a larger or a smaller number of votes than any other but upon the question whether the candidate polls a requisite minimum number of votes, irrespective of the number of votes polled by any other.

## THE SINGLE VOTE

As has been said above, the object is to secure, in an election by a combined electorate or varied interests, proportional representation, *i.e.*, a return of candidates representing interests in majority as well as minority, in proportion to their respective strength at the poll. To ensure this result, it will be apparent that the system that ordinarily obtains, *viz.*, the ballot or 'block vote' system, as it is called, under which each voter has as many votes as there are seats to be filled but cannot give more than one vote to any particular candidate, cannot avail. For, under it the majorities can return all the candidates from among themselves. A system, therefore, by which a voter cannot with equal efficacy choose his nominees for all the seats at one and the same time has to be devised and accordingly under the system herein discussed, each voter has only **one vote**, whatever the number of vacancies to be filled. His nomination or vote counts but for one candidate in the election.

## ITS TRANSFERABLE CHARACTER

But any single vote system cannot completely solve the difficulty. While it may safeguard the interests of minorities it may do injustice

to majorities. The latter, if not properly drilled, may either erroneously concentrate their votes on a particular favourite candidate under a misapprehension or diffuse their votes on too many under a miscalculation of their own strength. In both these cases their votes will be wasted and the end in view of proportional representation will be defeated. Consequently, the further device of transferability is engrafted on the single vote so that votes may not be wasted. The single vote is **transferable** from one nominee to another and that takes place in two contingencies where there would otherwise be a wastage of votes. They are:

(1) when a candidate obtains more than what is required for his success and therefore has an unnecessary surplus; and

(2) when a candidate polls so few votes that he has absolutely no chance and therefore the votes nominating him are liable to be wasted.

### THE SINGLE TRANSFERABLE VOTE

Thus by means of this system of the **single transferable vote** the problem is solved. Under this system each voter has only one vote, whatever the number of seats to be filled. He has not as in the ordinary ballot as many votes as there are vacancies. But this single vote is a trans-

ferable vote, transferable from one nominee to another. This character of transferability at once indicates that though the voter has only one vote, he records his preference for many by recording alternatively, *i.e.*, for A or B or C and so on. The voter indicates on the voting paper the order of his preference for the candidates by denoting it with the figures 1, 2, 3 and so on against the names chosen by him and this denotation is understood to be alternative in the order indicated.

### ITS SIGNIFICANCE

The meaning of such voting is, that the voting paper is first counted for the individual to whom the first preference is indicated and if the vote is necessary to enable him to obtain the requisite number of votes entitling him to be returned, the voting paper becomes exhausted and cannot afterwards be counted for any other. If, on the other hand, the candidate has otherwise secured enough votes to make up the requisite number, the surplus voting papers above that number are transferred, as hereinafter explained, to the individual in whose favour the next choice is indicated and each such transferred paper counts as a vote for him. In like manner, when the

candidate has polled so few votes that he has no chance of being returned at the election, and is consequently excluded from the poll, under rules which will be explained hereafter, the voting papers are transferred as in the case of a surplus to the person to whom the next preference is indicated on them.

### ITS VALUE

It should be noted that the voting paper is of the same value to the candidate in whose favour the last preference is indicated, in cases in which it is transferred to him, as it has to the candidate in whose favour the first preference is indicated. In both cases it counts as a full vote. There is only this difference, *viz.*, that while the voting paper is a *certain* vote to the first nominee and avails him irrespective of any other circumstance till the number of votes which are required for his success are polled by him, the same voting paper is only a *contingent* vote in favour of any other nominee lower down. When, as will be explained hereafter, the voting paper is assigned to a nominee lower down by transfer, it is as much a vote to him as other *certain* votes which he may have secured by being the first nominee and is likewise transferable to the nominee next to him, if the necessary conditions exist. As an

illustration of this aspect of the vote it may be pointed out that a candidate who is not the first nominee in any voting paper may still secure the *quota* and succeed in the election with the help merely of voting papers transferred to him from the parcels of others, provided that circumstances had not supervened entailing his earlier elimination from the contest altogether.

A POSSIBLE MISCONCEPTION

The indication of an alternative preference in favour of many candidates ought not, however, to be misunderstood as the recording of so many votes in favour of so many candidates. It should be clearly understood that the voter has only a *single vote* but that he is given the option to provide for successive transfers of his vote from one individual to another in certain contingencies.

It will be thus seen that the voting paper though it contains many names voted for on it, counts as a vote for only one and that until it is used by being counted as a vote for some one candidate whose name is marked on the paper, the voting paper is transferred from the candidate who is given an earlier preference to one who is given a subsequent preference. It may be that the voting paper either records the first preference in favour of or is trans-

ferred to one who polls ultimately less than the requisite number of votes entitling him to succeed and thus may not be of use either to declare the success of that candidate or for a transfer to a subsequent nominee, all the successful candidates being otherwise determined without recourse to such transfer. In such a case, we cannot say that the voting paper has not been utilised. It has been utilised: only the candidate for whom the vote was counted has failed and the election has ended requiring no further transfer of the papers of the failed candidate.

### A COROLLARY

It should also be remembered that marking the first or a few preferences only does not add greater value or efficacy to the vote in favour of the candidates preferred. On the other hand, the voter may thereby be merely depriving himself of the privilege conferred on him. For example, if the candidate who has his last recorded preference, happens to be eliminated from the poll, the voting paper will be set aside as useless for the reason that it contains no further transferable preference. The obvious result is that though the voter purported to vote at the election, he has not voted in a manner that could influence it. It is as if he had not voted at all.

### THE MERITS OF THE SYSTEM

An aspect of this transferability which is the greatest merit of this system is that not only is the vote never wasted but the intention of the voter is sought to be given effect to as far as possible. The meaning of the record indicating the order of preference of the candidates is obviously that the voter desires his first choice to succeed before every other and that if his vote is not helpful to his first choice (either by being superfluous or being of no possible assistance to him) he would like that vote to be of use to his second nominee without being wasted. And this is exactly what is done by the transfer of votes as indicated above.

## II. THE QUOTA

### WHAT IT SIGNIFIES

We spoke of a requisite number which if a candidate polls, he is entitled, without any further consideration, to be declared elected immediately. This requisite minimum is called the *quota.* The *quota* is the smallest number which will ensure the return of a candidate whatever combination be made of the other votes given in the election. It is such a number that as many candidates as there are seats open for

election may each get that number, but that no more can get it. It follows that the *quota* should be a fraction of the total votes polled validly at the election. It should also be the minimum number for the reason that the very purpose of the system is to provide for representation of minority interests. In fact, the *quota* indicates that a group of persons of that strength can return its own candidate, if of one mind and that a group of persons of less strength is not entitled to have a representative of its own. The group would consist of such a number that if the seats are distributed between divisions of the electorate, the smallest division that can have a representative will not be less than that number in strength.

### THE FORMULA

Now, that number is arrived at by dividing the total number of valid votes recorded at the election by the number of seats to be polled for increased by one, adding one to the result and dropping the fraction, if any. The number of valid votes recorded is alone the basis and not the strength of the electorate, as the object is only to fix the minimum number of votes which a successful candidate need secure at an actual election. To take a

concrete instance, if the total number of the valid votes recorded at an election is 1,500, and the number of seats competed for, 12, the *quota* will be 1,500 divided by 12+1 with 1 added to the result in integers, *i.e.*, 116.

THE FORMULA EXPLAINED

The reason of the method by which the *quota* is worked may be explained by an illustration in a popular manner. Suppose the number of valid votes recorded at an election is 50 and there is only one seat competed for. It will be apparent that so soon as any candidate has secured 26 votes, we can stop further examination of the votes; because on getting that number of votes, the candidate cannot be denied his return, by any means. Similarly suppose there are two seats competed for instead of one. As soon as a candidate secures 17 votes he can be declared elected; for any combination that can be made of the other 33 votes between the other candidates will leave one of the two seats competed for to the former candidate. It is equally clear that anything more than 26 or 17 is unnecessary while anything less cannot assure the candidate success and that the numbers are such, that only one and two respectively can poll and not more. And these are the charac-

teristics which the *quota* signifies. This 26 is obviously 50 divided by 1+1 with 1 added to the result and 17,50 divided by 2+1 with 1 added to the result. Analogically the method can be followed when more candidates than one or two have to be elected.

## III. THE VOTING

### THE MANNER OF VOTING

This depends upon the rules framed for purposes of the particular election. Each voter will ordinarily be supplied with a voting paper, a declaration form and two envelopes of different sizes, all of them or all but the voting paper bearing the number corresponding to the number which the voter bears on the electoral roll. The voter has first to sign the declaration form and, if so required by the rules, get it attested by a responsible officer specified in them and then record his vote on the voting paper, not necessarily in the presence of the attesting officer. The voting paper will contain the names of all the candidates competing and the voter has to signify his preference in the space allotted therefor by writing the numerals 1, 2, 3, etc., successively one against each name in the order of his preference. A voter may thus record his preferences for all the candidates competing or

he may record a few preferences only without recording his preferences for more, in which latter case, it may be, that, as already pointed out, he deprives himself of the privilege of influencing the election.

### GROUNDS OF INVALIDITY

If the voter does not mark figure 1 at all or marks figure 1 against more than one name or marks a figure in addition to figure 1 or places any mark by which he may afterwards be identified or the record of the vote is uncertain, the voting paper is totally invalid and is rejected altogether.

### GROUNDS OF NON-TRANSFERABILITY

If the same figure is marked against the names of two or more candidates or a figure not consecutively following upon another figure is marked or if the name of the same candidate is marked by two or more figures, that preference and those following it do not count and the voting paper can be counted only in favour of one of those for whom an earlier preference is indicated and thereafter will be non-transferable. It does not require to be said that if the voting paper does not record at all any preferences beyond that in favour of a successful candidate who has a surplus, or a

candidate who has been eliminated from the polls, the voting paper becomes thereafter non-transferable.

### THE DESPATCH OF THE VOTING PAPER

This again depends upon the rules in force. Ordinarily, after recording the vote, the elector has to put it into the smaller envelope and stick it up. He should then place this envelope and the declaration form into the bigger cover and send it to the returning officer or deposit it into the ballot box in the manner prescribed. If the envelope containing the voting paper is sent by post, but not registered, the vote may, under rules, be rejected. The envelope should reach the authorities concerned before the time fixed therefor and the deposit into the ballot box should likewise be made on the day and before the hour prescribed.

### SUPPLY OF DUPLICATE PAPERS

There are also provisions under which duplicate voting papers will be issued in certain circumstances.

## IV. THE COMPUTATION

### THE PRELIMINARY PROCESS

After the envelopes are received, the returning officer first arranges them in their serial order.

He then opens each of them in order, verifies if the number on the declaration form corresponds with that on the smaller cover and examines if the declaration form is the one sent out by him and the declaration itself is *prima facie* properly done and properly attested, where it is so required by the rules. If either of these conditions is not satisfied the envelope and the declaration form are laid aside and the voting paper therein enclosed does not count. Where these conditions are satisfied, the officer puts the smaller envelopes and the declarations in separate parcels and begins thereafter to deal with the parcel of envelopes. These are opened and the voting papers are counted, mixed together and then examined with reference to the validity of the record of the vote, as already explained. The valid voting papers are arranged in one parcel and the rejected ones are kept separate. Some rules also prescribe that if more than one declaration paper or more than one voting paper is enclosed in one and the same envelope, all the voting papers shall be rejected. It does not require to be stated that if there is no declaration paper at all, the envelope containing the voting paper will be rejected.

Then the returning officer counts the valid voting papers and arrives at the *quota* in the

manner described already. This done, the more difficult part of the computation begins.

THE FIRST AND SUBSEQUENT COUNTS

All the valid voting papers are first re-grouped into smaller parcels, one for each candidate, according to the first preference indicated in each paper. This is the first count. Then the number of *original* votes (the votes obtained as first nominee are so called) which each candidate polls is ascertained and the candidates that secure a number of such votes equal to or greater than the *quota* are at once declared elected. When this has been done, the result will be that there are some candidates, *viz.*, the successful ones, who have polled an excess of votes over the *quota* and there are the rest who have polled in *original* votes less than the *quota*. Now according to the principle of the transferable character of the vote, the surplus voting papers of the successful candidates in excess of the *quota* ought to be transferred and distributed to the several candidates in contest, called the *continuing* candidates, to whom the next preferences are indicated thereon.

The ascertainment of the result after such transfer is the second count and so likewise we have the third and the fourth counts, etc.,

after the second and third transfers etc. are made.

### WHOSE SURPLUS IS TRANSFERRED

If there is only one successful candidate who has a surplus, his surplus voting papers are transferred in the manner hereunder explained. But if there are more than one, the surplus of the candidate who has polled the largest number of votes is distributed and transferred first. As regards the surpluses of other successful candidates, they will be dealt with in their order after a second or subsequent count in accordance with the same rule, *viz.*, that if there is more than one surplus available for transfer the largest surplus shall be dealt with first. In such subsequent counts if the surpluses of two or more candidates are equal, the surplus of the candidate who polled the largest number of *original* votes is transferred first and if they too are equal, the returning officer has the discretion to decide which surplus he will deal with first.

### A SEEMING HARDSHIP

It would be noticed here that it may just be possible that even a second preference to a successful candidate may not be of any value, if the successful candidate does not happen to top the poll in *original* votes. For, before the occa-

sion for the distribution of the surplus of that successful candidate arises, it is possible that other successful candidates are determined by other transfers or exclusions as hereinafter explained and the election itself is over.

RULE, HOWEVER, RATIONAL

The rule above enunciated is not, however, by any means an arbitrary or irrational one. It is exactly, as it should be, in conformity with the basic principles of this system. The will of the interests in minority is respected by the scheme of the single vote and therefore the first count sufficiently protects their interests. The device of transferability, as has been said, is introduced for the benefit of the indiscreet majority. Thus when a question of transfer arises it is the will of the majority that should guide the operation and have preferential effect given to it. It necessarily follows that the bigger majority must have their voice heard before the smaller one. The wastage of votes that is intended to be guarded against by the scheme of transfer would certainly be more in the case of a larger surplus than in the case of a smaller one. It is, therefore, but consistent with the scheme that the larger surplus should first be turned to useful purpose.

### AN ARGUMENT ANSWERED

Yet a question may be raised, why all the available surpluses should not be dealt with at once. The test of selection of a candidate is his obtaining the *quota,* and more than the number of candidates to be selected cannot admittedly obtain it. A simultaneous transfer, therefore, cannot lead to any conclusion that can be characterised as absurd. Why then should not a rule of simultaneous transfer be accepted? The reason for the rule to the contrary is this. In the first place, a simultaneous transfer would be justifiable only on the assumption that a second preference as such has a value irrespective of the question to whom the first preference in the voting paper is recorded. This assumption is a fallacy and has already been explained. A second or subsequent preference creates a contingent right to a vote and the value of the right necessarily varies with the greater or lesser possibility of the contingency arising and is, therefore, different with reference to the chances of the candidate in the first or earlier preference. It follows from this, that it is only by successive operations graded, as far as possible, according to the value of the contingent right, that it is at all possible to ascertain the intention of the electorate as closely as possible.

And, in adopting a scheme of simultaneous or consecutive transfers of all available surpluses, it is quite likely that you may select a candidate who ought ultimately to be rejected or reject another finally who ought to have been selected. Last, but not least, there is the reason of inconvenience and difficulty in reckoning. One cannot predicate, if the contrary rule were to prevail, which papers have to be examined and transferred with reference to further preference and there will be a further uncertainty added to the hardship of the rule relating to the particular papers to be transferred, which is canvassed hereunder. The criticism is certainly open that even by the method suggested by the rule, the will of the electorate cannot be accurately gauged. The only answer is, that it is the nearest approximation to correctness consistently with the scheme and creates the least confusion in operation.

### TO WHOM TRANSFERRED

We have said that the votes are transferred to the *continuing* candidate. Now a *continuing* candidate is one who has been neither elected nor excluded from the poll under conditions which will hereafter be explained. Therefore, if in a transfer of a surplus resulting from the

first count, we find the second preference indicated in favour of another successful candidate, then, that vote is transferred to the individual not being a successful candidate who is next thereto in preference. The same principle is applied, when two or more successful candidates intervene or when a candidate or candidates who have been excluded intervene.

### THE MODE OF TRANSFER

Now as to the mode of transfer of the surplus. The obvious question will be which of the voting papers of a successful candidate are to be treated as the surplus and which of them are to be transferred to the candidates in next preference. For this purpose, if the surplus is the surplus after the first count, *i.e.*, consists wholly of *original* votes, all the voting papers of the candidate are examined and re-grouped into smaller sub-parcels with reference to the next preferences to *continuing* candidates indicated thereon. If, however, the surplus is one resulting in a second or subsequent count the entire parcel of the successful candidate is not examined but only the sub-parcel last received by him by way of transfer, for the reason hereunder explained. There may be amongst them some papers which are non-

transferable either because they indicate no subsequent preferences or indicate them in a manner contrary to the rules. These papers are also separately grouped. Then if the available surplus or the excess over the *quota* is more than, or equal to, the number of transferable papers in the parcel or sub-parcel of votes, as the case may be, of the successful candidate, each one of the surplus transferable papers is transferred to the *continuing* candidates to whom the next preference is given; as, for example, when the *quota* is 50 and the successful candidate polls 100 votes, thus having a surplus of 50 and on examination 70 of the 100 votes record no valid second preferences. But if the surplus available for transfer is less than the number of transferable votes in the successful candidate's transferable parcel, only a proportion of the subparcels, in the same proportion which the surplus bears to the total number of transferable papers, will be transferred. Thus if the available surplus votes are 50, the total number of transferable papers in the whole parcel, 200, and the next preferences to the *continuing* candidates A, B and C are in 120, 60 and 20 papers respectively, the 50 surplus voting papers will be distributed, 30 to A, 15 to B and 5 to C. In working out this proportion, fractions may

result. In such a case, as many of the largest fractions as are necessary to make up the total of the surplus, are made integers and the other fractions are disregarded. Thus, if in distributing 50 surplus votes, A has to get 29 1|3 B, 10 3|5 and C, 10 1|15, B's fraction is made a unit and he gets 11 votes, C, 10 votes, and A, 29 votes. If the fractions are equal regard will be had to the largeness of the sub-parcel and if the sub-parcels too are equal, then, to the number of *original* votes polled by the candidates.

REASON FOR THE RULE.

It may perhaps require to be explained why, while all the voting papers of a candidate successful in the first count are examined with reference to the next preferences for purposes of transfer, only the sub-parcel of papers received by the candidate in the transfer last made to him is examined, in the case of a candidate who is returned at a second or subsequent count. To appreciate this, we should keep in mind two things. The first is that for every successful candidate a number of voting papers equal to the *quota* must be reserved and set apart for him exclusively. The other is that a voting paper, if counted to make up the *quota* of any candidate, is not available for transfer to any

other. Now, in the case of a candidate successful in the first count, he has polled more than the *quota* and it is impossible to predicate which of the votes he has polled are not available for transfer as being required to be set apart for his *quota*. Hence the necessity to examine all his voting papers. But in the case of a candidate who is returned only in a second count, the position is different. He is one whose *original* votes were admittedly below the *quota*, so that they were all required for him to make it up and were not available for transfer. And it is obvious that such voting papers which are not admittedly available for transfer need not be examined for purposes of transfer. Similarly, where a candidate makes up his *quota* only after two or more transfers to him, the papers transferred to him in the transfers except the last have to be ear-marked for his *quota* and are not available for transfer. Therefore it is, that the sub-parcel of voting papers last received by the successful candidate is alone examined.

## WHICH PAPERS ARE TRANSFERRED

Then as to the particular papers which are to be transferred from the sub-parcels, the rule says that the papers last filed shall be transferred.

## RULE ARBITRARY

This is an arbitrary rule and may work injustice, when these transferred voting papers result in a surplus to the candidate to whom they are transferred and such surplus out of the transferred lot has again to be transferred in favour of the candidates in the next preference. These subsequent preferences may vary with each voting paper though the earlier preferences may be common to them all. The papers last filed that are transferred may contain a larger or a smaller number of preferences to a particular candidate than other voting papers filed earlier in the same sub-parcel. To illustrate, suppose there are ten voting papers in the parcel of the *original* votes of A in which the first and second preferences are to A and B while the third preferences are to P in eight papers and to Q in the two last. Suppose B holds 49 *original* votes when the *quota* is 50 and suppose also that two papers alone out of A's surplus are transferable to B and it happens that under the rule above quoted, the two such papers are the last two above mentioned, *viz.*, those in which the third preference is to Q. Now B having thus secured 51 votes, his surplus, one voting paper, may be transferred to the preference next to him and the paper which

is so transferred will be, under the rule above-mentioned, the paper last filed, *viz.*, the paper containing the third preference to Q. Thus Q will get the vote by a mere accident though P had eight third preferences to his credit and Q had only two.

DECLARATION OF RESULT ON TRANSFER

When a transfer of papers has been effected as above described, the transferred votes are counted along with the *original* votes and if together they are equal to or more than the *quota* the candidate is declared elected. The surplus of his votes in excess of the *quota* will again, in the same manner, be available for further transfer.

THE QUOTA OF THE SUCCESSFUL CANDIDATE

The voting papers allotted to answer the *quota* of the successful candidate will, in the case of a candidate successful at the first count, be the non-transferable papers picked out of his parcel at the time of the examination of his papers for purposes of transfer, together with the transferable papers of his that remain after a part of them had been assigned to candidates in subsequent preference, under the rules prescribed above. In the case of a candidate declared elected in a second or subsequent count,

such papers will be all the *original* votes of the candidate together with the balance of the votes transferred to him but which had not been further transferred to a candidate in subsequent preference to himself.

### EXCLUSION FROM THE POLL

We have referred to the exclusion of candidates. Who they are and when they are excluded require to be explained. Just as there is the process of removing from the contest successful candidates who poll the *quota* or more, there is the process of exclusion of candidates from the contest by elimination of the weakest. This is done in two cases. When there is no surplus of any successful candidate available for transfer and one or more vacancies remain unfilled, the returning officer shall exclude from the poll the candidate credited with the lowest number of votes and transfer his votes according to the next preferences indicated thereon in favour of the *continuing* candidates. If in this case two or more candidates lowest in the poll have each the same number of votes, regard shall be had to the largest number of *original* votes credited to each and the candidate with the fewest number of *original* votes shall be excluded. Where the num-

bers of the *original* votes are also equal, regard is to be had to the total number of voting papers credited at the first and the subsequent transfers in succession, and, if they are equal at all the transfers, lots are to be cast. It will be noticed that this rule of exclusion will come into operation when no candidate obtains the *quota* even in the first count.

Again, even though there may be a surplus of a successful candidate available for transfer, the returning officer need not transfer such a surplus but may proceed to eliminate the last candidate, when the surplus of the elected candidate together with any other surplus not transferred, is less than the difference between the total of the votes credited to the two *continuing* candidates lowest in the poll, *i.e.*, the penultimate and the last candidates. In such a case it will be seen that the candidate lowest in the poll is unable to go even one place higher, though all the surplus voting papers be assigned to him; which means, that he will always be the last and consequently may well be excluded. Thus, if A and B are the penultimate and last candidates on the poll and have to their credit 50 and 20 votes, respectively and the total of all surpluses transferable and not transferred is 25, B will be excluded.

### EXCLUSION BEFORE TRANSFER

It will thus be seen that where the rules both of exclusion and of transfer are applicable, the rules of exclusion are applied in preference.

### REASON OF THE RULE

These rules of exclusion are again the outcome of the attempt to arrive at the closest approximation to the intention of the electorate. We have already explained that the device of a transfer of voting papers is towards this end. An occasion for a transfer of voting papers arises when the votes are liable to be wasted on any candidate. One such occasion is when a candidate polls more than the *quota*. In such a case, the presumed intention of the voter, *viz.*, that if he knew that his first nominee would otherwise secure his *quota* he would have nominated the candidate in second preference in his voting paper as his first nominee, is given effect to by transferring the surplus over the *quota* to such second nominee. Likewise, when a candidate is ascertained to be so hopeless in the contest that he has no chance of success and there will be no good retaining him in the contest further, the voting papers in which he is the first nominee are equally wasted on him and the intention of the voter may well be carried

out by allotting the voting papers to the respective second nominees in them. It should be remembered that this operation is done only when the candidate stands no chance of being returned even by the possible benefit that may accrue to him by a transfer from the surpluses of other candidates. Therefore it is, that the rule of exclusion takes effect only when the relative position of the last candidate in the contest is not altered in the poll even on the assumption that all the available surpluses are transferred to him solely. The same principles would explain how, when there is no surplus at all available for transfer, the last candidate in the poll is excluded.

### TRANSFER ON EXCLUSION

The transfer in this case will not be the transfer only of a portion of the voting papers of the candidate or candidates excluded, as in the case of the surplus of the successful candidate, but will obviously be of all the voting papers of the candidate or candidates excluded. In the case of a surplus on election, the *quota* for the successful candidate has to be accounted for and a number of voting papers to answer it have to be retained. But in the case of exclusion no such retention is necessary.

## EXCLUSION OF SEVERAL CANDIDATES IN ONE OPERATION

Where the exclusion takes place under the rule which enables such exclusion even when there is a surplus of a successful candidate available for transfer, there is a provision enabling two or more candidates to be excluded and their voting papers transferred to *continuing* candidates in subsequent preferences in one and the same operation, provided that the total of the voting papers of two or more candidates lowest on the poll together with any surplus voting papers not transferred, is less than the number of voting papers credited to the next higher candidate. Thus, if A, B and C are three candidates lowest on the poll, having secured 250, 120 and 70 votes respectively and the total of the surpluses transferable and not transferred is 40, then both B and C can be excluded and their voting papers transferred in one operation under this rule.

## DIFFERENCE BETWEEN TRANSFERS ON EXCLUSION AND ELECTION

In this respect, the rule of exclusion and transfer differs from the rule of election and transfer; for, in the latter case, the surplus

of more than one successful candidate is not transferred in one operation. The above rule of exclusion is obviously subject to the proviso, that there are, after such exclusion, enough *continuing* candidates for election.

### REASON FOR THE DIFFERENCE

This follows as a necessary consequence of what has been explained under the heading 'Rule, however, rational,' in dealing with the transfer of surpluses. In a transfer on exclusion, each and every voting paper on which a second or subsequent preference to a *continuing* candidate is indicated is itself transferred as distinguished from a case of transfer on election in which, out of the transferable surplus, only a proportion is transferred. Consequently the contingent value of valid second or subsequent preferences upon the exclusion of each of many candidates excluded from the poll is identical. There can therefore be no objection to the simultaneous distribution of voting papers which have equal value. And further there is no difficulty arising on the question of the particular papers to be transferred, as all the papers of the excluded candidates are transferred *en bloc.*

## A RULE OF SIMULTANEOUS ELECTION AND EXCLUSION

On the same principle of exclusion, when only one vacancy remains unfilled and the voting papers of some one *continuing* candidate exceed the total of all the voting papers of the other *continuing* candidates together with any surplus not transferred, that candidate shall be declared elected without the necessity of a transfer of voting papers.

## A RULE FOR FINAL ELECTION

When by these processes of election and exclusion the number of *continuing* candidates is reduced to the number of vacancies remaining unfilled, the *continuing* candidates are declared elected.

## APPENDIX

### EXPOSITION BY PRACTICAL APPLICATION

We may illustrate the principles and rules above adverted to, particularly the more important of them, *viz.*, those relating to transfer and exclusion, by taking an instance of a possible election.

Suppose there are five seats competed for and there are ten candidates A, B, C, D, E, F, G, H, J and K. Suppose also that the number of valid votes recorded at the election is 6,002, excluding those rejected under the rules, on the grounds of delay in receipt of voting paper, improper declaration, invalid voting, etc.

#### THE QUOTA

This is 6,002 divided by 5 plus 1, with one added to the quotient, *i.e.*, 1,001. It will be noticed that the fraction in the result of the division is dropped.

#### THE FIRST COUNT

The 6,002 papers are arranged on examination into separate parcels with reference to the

first preferences recorded for A, B, C, etc. The result of this first count is as follows:—

| | | | |
|---|---|---|---|
| A. | has | 939 | voting papers. |
| B. | .. | 1014 | .. |
| C. | .. | 2009 | .. |
| D. | .. | 748 | .. |
| E. | .. | 493 | .. |
| F. | .. | 321 | .. |
| G. | .. | 157 | .. |
| H. | .. | 152 | .. |
| J. | .. | 118 | .. |
| and K. | .. | 51 | .. |

*B and C having polled more than the quota are elected,* and their surpluses over the *quota* are available for transfer. But, under the rules, the largest surplus, *i.e.*, C's, has to be transferred first.

FIRST TRANSFER

As the parcel of C consists wholly of *original* votes, all the 2,009 papers in his parcel are examined for next preferences to *continuing* candidates, *i.e.*, the others excluding B. The result of the examination and analysis into so many sub-parcels is that the second preference is recorded for

D in 253 papers, F in 10 papers,
E in 5 papers, and G in 1,739 papers,

and two papers are non-transferable as recording no subsequent preferences to *continuing* candidates, making up the total of 2009 papers.

Thus, the total transferable papers, *viz.*, 2,007, contain second preferences to D, E, F and G in the proportion indicated above. But as there are only 1,008 papers available for transfer as the surplus of C, the 1,008 papers must be allotted in the same proportion. Thus,

D will get by transfer only $\frac{1008}{2007} \times 253 = 127\frac{135}{2007}$

E ,, $\frac{1008}{2007} \times 5 = 2\frac{1026}{2007}$

F ,, $\frac{1008}{2007} \times 10 = 5\frac{45}{2007}$

and G ,, $\frac{1008}{2007} \times 1739 = 873\frac{801}{2007}$

The total of the integers on the right hand side is 1,007 and as this is 1 less than the number of papers available, *viz.*, 1,008, the biggest of the four fractions is reckoned as unity so that D gets 127 papers; E, 3 papers; F, 5 papers and G, 873 papers. The transfer is accordingly made and the papers actually transferred are, under the rules, the papers

last filed in the sub-parcel of each, as made up on the examination and separate allotments of the 2,009 papers of C.

### RESULT OF THE FIRST TRANSFER

As the result, A has 939 papers.<br>
B „ 1014 „<br>
C „ 1001 „<br>
D „ 748 + 127 = 875 papers.<br>
E „ 493 + 3 = 496 „<br>
F „ 321 + 5 = 326 „<br>
G „ 157 + 873 = 1030 „<br>
H „ 152 papers.<br>
J „ 118 „<br>
and K „ 51 „

and remembering that the transferred papers have equal efficacy with the *original voting papers, G is declared elected, he having secured more than the quota.*

### ALLOTMENT FOR C'S QUOTA

The papers to answer for the *quota* of C must now be set apart, as not being available for further transfer. These have functioned because they have been utilised to secure C's success. For this purpose, the 2 non-transferable papers and the 999 papers made up from the balance, after the transfer as aforesaid, in the several sub-parcels of D, E, F and G are allotted for C's 1,001 voting papers.

Now there are the surpluses of B and G available for transfer, if necessary, and, if a transfer were made, G's surplus being the biggest of the two would be transferred. But at this stage another rule comes in, *viz.*, the rule of

EXCLUSION

The total of the surplus of the selected candidate, G and of the surplus not transferred of B, is 29 plus 13, *i.e.*, 42, which is less than the difference in votes between the penultimate candidate J, and the last candidate K. Therefore, K is excluded from the poll and his voting papers are transferred to those in next preference as recorded thereon.

SECOND TRANSFER

K's 51 voting papers are examined and they record next available preferences to A in 5 papers and to F in 46 papers and these are accordingly transferred. There is no question of working out a proportion here as all the papers examined are transferable and are transferred.

RESULT OF SECOND TRANSFER

| | | | |
|---|---|---|---|
| A | has | 944 | papers. |
| B | ,, | 1014 | ,, |
| C | ,, | 999 + 2 non-transferable papers. | |

| | | | |
|---|---|---|---|
| D | has | 875 | papers. |
| E | „ | 496 | „ |
| F | „ | 372 | „ |
| G | „ | 1030 | „ |
| H | „ | 152 | „ |
| and J | „ | 118 | „ |

As no further candidate gets the *quota,* we have to proceed with the next operation.

### EXCLUSION OF TWO CANDIDATES IN ONE OPERATION

Another rule provides that if the total of the voting papers of two or more candidates lowest on the poll, together with any surplus voting papers not transferred, is less than the votes credited to the next highest candidate, the returning officer may, in one operation, exclude those candidates from the poll and transfer their voting papers to next preferences. Now the total of the votes of H and J is 270 which together with the surpluses not transferred, *i.e.,* 42 is 312 and is less than the votes of F, the next highest candidate. So, H and J can be excluded and their voting papers transferred.

### THIRD TRANSFER

The papers of H and J on examination disclose second preferences to A in 86, E in 1, and F in 107 papers. 14 others record no second

preferences and are non-transferable. The balance of 62 papers show a second preference to B but B being off the poll as a successful candidate, the next preferences are examined in the same operation. This discloses 32 to C, 28 to D and 2 to E. But C being a successful candidate and not a *continuing* candidate the 32 papers are further examined with the result, that the next preferences thereon are to D in 5 papers, to E in 4 papers, to F in 10 papers and 13 papers record no further preference and are non-transferable. The net result of this examination and analysis is that

86 papers are transferable to A
28+5=33 .. D
1+2+4=7 .. E
107+10 =117 .. F

and 14+13 = 27 papers are non-transferable. It should be observed here that even later preferences have value, provided that the earlier preferences are in favour of successful or excluded candidates. The result above shown is arrived at in one operation, though the exposition in the paragraph might suggest different and successive operations.

RESULT OF THIRD TRANSFER

A has 1030 voting papers.
B .. 1014 ,,

| | | |
|---|---|---|
| C | has | 999+2=1001 voting papers. |
| D | .. | 908 voting papers. |
| E | .. | 503 ,, |
| F | .. | 489 ,, |
| G | .. | 1030 ,, |

and there are 27 non-transferable papers in a separate parcel.

Now A *having secured more than the quota is declared elected*, and the surpluses of A, B and G are available for transfer. Under the rule already applied, the largest surplus ought to be transferred first. But the surpluses of A and G are equal and the rule to be followed under the circumstances is, that the surplus of the candidate having the larger number of *original* votes ought to be dealt with. Therefore A's surplus has to be transferred. We also see that there is no scope for the application of any of the rules of exclusion.

FOURTH TRANSFER

Now what are the papers in the file of A that should be examined for this purpose? A's file contains the parcel of 939 *original* votes, a sub-parcel of 5 votes transferred to him from K and another sub-parcel of 86 votes last received from H and J.

For the reasons already explained, these last 86 votes alone have to be examined. These are

first arranged in sub-parcels according to next preferences to *continuing* candidates and then the proportion of transferable papers in the various sub-parcels with reference to the total of the transferable papers, *viz.*, 29, is ascertained, in the manner shown in the first transfer. The final result of the operation is that out of 29 papers, 6 are transferable to D, 9 to E and 14 to F, and this is carried out.

### RESULT OF FOURTH TRANSFER

A and C have the *quota*, B has 1,014 papers; D, 914; E, 512; F, 503 and G, 1,030. There are 2 non-transferable papers in the parcel of C's *quota* and 27 other non-transferable papers in a separate parcel. No further candidate having polled the *quota*, there is no declaration of election to make. So we proceed with the next operation as a fifth candidate has to be elected.

### ALLOTMENT FOR A'S QUOTA

A's quota of 1,001 papers is made up of 939 *original* votes, 5 of K's votes transferred to him and 57 of the votes of H and J out of the sub-parcel of 86 votes which was made into further sub-parcels with reference to preferences to D, E and F. These 57 must be the papers earlier filed in the sub-sub-parcels (to use such an expression) of D, E and F; for, out of the

papers in the sub-sub-parcels those transferred to D, E and F as abovementioned are those last filed in them.

### FIFTH TRANSFER

Now there are the surpluses of B and G available for transfer and there is no scope for the exclusion of any candidate. G's surplus being larger than B's, is transferred.

Then as to the papers of G which have to be examined for purposes of transfer, the 873 papers in his file that were transferred to him from C's parcel must be examined. The reason has been already explained and a similar operation was performed in the previous transfer.

The net result of the examination, analysis and the working out of the strict proportions actually transferable, from out of the surplus of 29 votes of G is that

2 papers are transferable to D,
11 " E,
and 16 " F.

It is also found that 16 papers are non-transferable in the bundle of 873 papers that were examined. The actual papers transferred are those filed last in the sub-parcels, as already stated.

### ALLOTMENT FOR G'S QUOTA

G's parcel having been examined and his transferable surplus transferred, his *quota* must now be found. It would consist of 157 *original* votes, 828 papers (those earlier filed) out of the transferable portion of 844 (873 — 29) votes out of the sub-parcel obtained by him from C's surplus, *viz.*, 873 papers, and 16 non-transferable papers therein, making in all 1,001 papers.

### RESULT OF FIFTH TRANSFER

Now A, C and G have each the *quota* in their files. B has 1,014 papers, D, 916, E, 523 and F, 519. There are 2 non-transferable papers in A's file and 16 in G's file and 27 in a separate parcel. No new candidate can be elected on this result.

### SIXTH TRANSFER

Now B's transferable surplus is transferred. There are 13 of them and to transfer them, all the 1,014 papers in the file of B must be examined as they are all *original* votes. The net result of calculating the strict proportions in which these 13 papers will be transferred to *continuing* candidates is that 1 paper goes to D, 4 to E and 8 to F.

## RESULT OF SIXTH TRANSFER

A, B, C and G have been allotted each his quota; D has 919 papers, E, 527 and F, 527. There is a separate parcel of 27 non-transferable papers.

Now at this stage, there is no surplus available for transfer and yet there is a fifth candidate to be elected. There are 3 continuing candidates and the votes of any one of them do not exceed the total of the votes of the other two. If it were otherwise, such a one would be declared elected, under the rules, the other two being eliminated. Therefore, the only rule applicable is that the candidate with the lowest number of votes shall be excluded. But there are two such here and, in such a case, the rule says, the candidate with the fewest *original* votes shall be excluded. On this basis, F goes out and all his voting papers, *original as well as transferred,* are transferred to subsequent nominees amongst *continuing* candidates, *viz.,* D and E.

## SEVENTH TRANSFER.

The result of the transfer is that 109 papers are added to D's parcel and 398 to E's and 20 papers are non-transferable.

RESULT OF THE SEVENTH TRANSFER

D now gets 1,026 papers and more than the *quota. So he is the fifth candidate declared elected.*

The election is now closed. C, B, G, A and D have been elected in the order mentioned.

The series of operations may be expressed as in the tabular form on the next page.

| Names of Candidates. | First Count. | Transfer of C's Surplus. | Result of 1st Transfer. | Transfer of K's Votes. | Result of 2nd Transfer. | Transfer of Votes of H & J. | Res ransfer. 3rd T | Transfer of A's Surplus. | Result of 4th Transfer. | Transfer of C's Surplus. | Result of 5th Transfer. | Transfer of B's Surplus. | Result of 6th Transfer. | Transfer of F's Votes. | Result of 7th Transfer. | Final Result of Election. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A | 939 | .. | 939 | + 5 | 944 | + 86 | 1030 | —29 | 1001 | .. | 1001 | .. | 1001 | .. | 1001 | Elected. |
| B | 1014 | .. | 1014 | .. | 1014 | .. | 1014 | .. | 1014 | .. | 1014 | —13 | 1001 | .. | 1001 | Elected. |
| C | 2009 | —1008 | 1001 | .. | 1001 | .. | 1001 | .. | 1001 | .. | 1001 | .. | 1001 | .. | 1001 | Elected. |
| D | 748 | + 127 | 875 | .. | 875 | + 33 | 908 | + 6 | 914 | + 2 | 916 | + 1 | 917 | +109 | 1026 | Elected. |
| E | 493 | + 3 | 496 | .. | 496 | + 7 | 503 | + 9 | 512 | +11 | 523 | + 4 | 527 | +398 | 925 | .. |
| F | 321 | + 5 | 326 | +46 | 372 | +117 | 489 | +14 | 503 | +16 | 519 | + 8 | 527 | —527 | .. | .. |
| G | 157 | + 873 | 1030 | .. | 1030 | .. | 1030 | .. | 1030 | —29 | 1001 | .. | 1001 | .. | 1001 | Elected. |
| H | 152 | .. | 152 | .. | 152 | —152 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| J | 118 | .. | 118 | .. | 118 | —118 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| K | 51 | .. | 51 | —51 | ,, | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Non-transferable papers. | .. | .. | .. | .. | .. | + 27 | 27 | .. | 27 | .. | 27 | .. | 27 | + 20 | 47 | .. |
| Total. | 6002 | .. | 6002 | .. | 6002 | .. | 6002 | .. | 6002 | .. | 6002 | .. | 6002 | .. | 6002 | .. |

## SOME PRESS OPINIONS.

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**Madras Mail.**—"We have met with many books and pamphlets on Proportional Representation, but none which expounds its method more succinctly or clearly than Mr. Krishnaswami Aiyar's treatise."

**Daily Express.**—". . . . . . is a very informing exposition on a subject of the utmost importance to modern democracy * * * * The author has dealt with the subject exhaustively and with much ability."

**Swarajya.**—"Though the system is at first sight so puzzling and seems so complex and intricate, a perusal of Mr. K. V. Krishnaswami Aiyar's pamphlet would show how simple it is really. The two basic principles, *viz.*, the single vote and its transferable character, have been clearly explained in lucid form and in simple language and the methods by which the results of an election conducted under this system are ascertained have been traced logically to the underlying principles. Mr. Krishnaswami Aiyar has explained with an amount of ingenuity how the seemingly arbitrary rules in the computation are really quite rational and sound and cannot be anything different consistently with the principle on which the system is founded. The transfers and exclusions are well explained and illustrated and the method of computation has been made clear by the exposition of a practical instance of an election. * "

**Janmabhumi.**—"* * making available to the public in a succinct form a description of the principles and the *modus operandi* connected with P. R. * * * The subject is dealt with in simple language. The series of transfers is well illustrated. The exclusions are clearly explained. And one wonders after reading the booklet how simple after all P. R. is."

**Leader.**—"It is beyond the scope of this short review to explain the system at length. The author has done that admirably in the pamphlet and we have no hesitation therefore to recommend it to the readers who wish to acquire a rudimentary knowledge of the system."

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